



Diabetic care towards the end of life

Dr. Meng-Jung Chen, Department of Family Medicine, Chi-Mei Medical Center, 901, Chung-Hwa Road, Tainan, Taiwan.

Corresponding Author: Dr. Meng-Jung Chen, Department of Family Medicine, Chi-Mei Medical Center, 901, Chung-Hwa Road, Tainan, Taiwan.

Type of Publication: Review Article

Conflicts of Interest: Nil

Abstract

Abstract

Towards the end of life, blood glucose control is no longer a priority. It is much more important to keep the patient in a comfortable state and watch out for severe problems such as hypoglycemia and hyperglycemia.

Towards the end of life, blood glucose control goals need to be reset to prevent hypoglycemia. Health care providers need to discuss with the patient and their family to develop plans for glucose monitoring, medication adjustments, what things to expect in the end of life period, and the signs and symptoms of hypoglycemia and hyperglycemia so they can help managing these complications and keeping the patients in peace.

Keywords: Diabetes, End of Life, Glycemic Control

Introduction

The purpose of this review is to explore the blood glucose control in patients with diabetes towards the end of life. The guidelines for instruction and management need to be made to help treating these patients towards the end of life. This review article was done by using data base from pubmed to find the optimal diabetic care towards the end of life.

Discussion

What Define the End of Life?

We usually define the end of life when patients are likely to expire within the next 6 months including the following conditions.

1. Patients with advanced, progressive and incurable conditions such as terminal cancers and other end stage diseases.
2. Patients with unstable vital signs, severe frailty and multiple comorbidities causing many unplanned hospital admissions with more dependence and need for all sorts of life support.

Glycemic Control in the End of Life

Monitoring blood glucose

Decisions in the end of life period regarding glucose management include how frequent blood glucose should be checked. Most health care providers feel constant blood glucose check with finger pricks is not necessary; some may want to continue monitor glucose level on certain circumstances. Diabetic care towards the end of life should focus on preventing hypoglycemic and hyperglycemic complications. For patients with weeks or months to live, most agree keeping blood glucose between the level of 180 and 360 mg/dl. The ideal level can be adjusted according to individual needs, and its possible risk for hypoglycemic and hyperglycemic complications. Finger sticks for glucose monitoring can be reduced from once every

other day to once a week depending on condition, while patients who need insulin injection including type 1 diabetes patients may need more frequent blood glucose check. Monitoring blood glucose level by checking Hemoglobin A1c may no longer be necessary.

Medication adjustment in type 1 and type 2 diabetes

Type 1 diabetes

Patients who have Type 1 diabetes may need to continue their insulin use and blood glucose testing which is helpful to prevent the discomfort of hyperglycemia. If a person's appetite is very poor, insulin dose should be reduced. For people with type 1 diabetes, going completely without their usual insulin may cause a very serious condition such as diabetic ketoacidosis (DKA).

Type 2 diabetes

For those people who have Type 2 diabetes towards the end of life, the management direction will be different. Discontinuing or reducing blood glucose tests and the previous oral diabetes medication are well accepted. The patients and their family should be instructed regarding the early signs of hypoglycemia. For patients who have already suffered from organ failure, preventing hypoglycemia becomes the major goal. Glucose monitoring is needed only when the possibility of hypoglycemia or severe hyperglycemia exists. The use of insulin may be indicated in severe hyperglycemic condition.

Hypoglycemia

Patients and their family should be able to know the symptoms and signs of hypoglycemia which may include shivering, cold sweating, anxiety, irritability, conscious change, palpitation, blurred vision or a sensation of hunger. Hypoglycemia may occur if patient is eating very little and still receiving the same medications. Hypoglycemia should be detected early

and treated as soon as possible by giving about 15 grams of carbohydrate such as a small cup of juice or two tablespoons of sugar or honey to raise blood sugar and if necessary repeated another serving again and again. Once the blood glucose level is back to normal, eat a meal or continue regular tube feeding to prevent from further hypoglycemia.

Towards the end of life, blood glucose control goals need to change from maintaining blood glucose level to preventing hypoglycemia. Doctors and other health care providers need to talk with the patients and their family to set plans for diabetes monitoring and management. Education about what to expect towards the end of life and the signs and symptoms of hypoglycemia is important, so they can help managing these conditions.

Hyperglycemia

Elevated blood glucose level at this moment usually will not be a problem, but very high blood glucose levels can cause severe discomfort and should be avoided. In those who have Type 2 diabetes, very high blood glucose levels can lead to a serious problem known as hyperosmolar hyperglycemic syndrome (HHS) which may likely to occur under certain condition such as infection or dehydration. Symptoms to be taken care of include thirst, urinary frequency, tiredness, dry mucosa, and fever which may indicate problems like pneumonia and urinary tract infection. Adequate hydration with appropriate insulin and treatment of the underlying problem can help to deal with this situation.

The usual treatment principle of diabetes is to keep blood glucose levels as close to normal as possible when the patient is young in health and in good condition. Towards the end of life, maintaining blood glucose levels in the normal range is no longer a

priority. The management plan of diabetes will change mainly to avoid hypoglycemia and the uncomfortable symptoms of hyperglycemia rather than preventing long-term complications.

High dose steroids and glycemic control

High dose corticosteroids are sometimes prescribed to relieve pain or pressure from cancers in people towards the end stages of life. High dose corticosteroids can lead to high blood glucose levels.

When steroids are used in short term, the need for further treatment may not be needed. If high dose steroids are used for a prolonged period of time, it is important to monitor blood glucose levels. If a very high blood glucose level is noted, careful use of insulin and oral medications for diabetes may be given with more frequent monitoring. This regimen can be gradually reduced if steroids are under tapering.

Nutrition and fluids

Restrictions on diet are not needed in the end of life. Eating and enjoying foods help patients feel better; loss of appetite may indicate that the patient is too sick or loses interest of eating. In these cases small meals and dessert with sugar or chocolate added can be offered. The withdrawal of fluids is still controversial. Fluids such as beverage or drinks should not be withdrawn unless the patient does not wish to take it. If the patient presents with obvious signs and symptoms of dehydration such as thirst, dry mouth or conscious change, rehydration should be given and reviewed to check for any improvement. If there are signs of fluid overload, one may reduce or discontinue the hydration.

Key management

The most important part of managing diabetes towards the end of life is to provide safety, comfort and quality of life rather than on reaching target blood glucose control. The prevention of hypoglycemia and

hyperglycemia incident is of utmost importance. The blood glucose target and care plan need to be individualized to fit the patient's condition. The main care challenges are to detect symptoms of hypoglycemia and hyperglycemia in time and to care properly as soon as possible. Doctors and other health care providers need to design a management plan according to the wishes of the patient and their family and to decide on when to discontinue treatment. Getting a perfect blood glucose level is no longer a concern any more. We used to practice and believe that keeping blood glucose levels in the normal range can help to reduce the risk of complications later in life – this is not needed any more for those who are under hospice care or towards the end of life.

Conclusions

Managing patients with diabetes towards the end of life can be great challenges both for the family and the health care providers. Blood glucose control can be very difficult if patient is under corticosteroids or other special treatment. The aim of treatment should be mainly on preventing the complications of hypoglycemia and hyperglycemia, rather than reaching a target goal level. The doctors and other health care providers should involve the patient and family in decision-making regarding treatment. Restrictions on diet are not needed towards the end of life. Patient taking insulin or other medication may need to reduce their doses to avoid hypoglycemia, especially if their appetite is poor. Hypoglycemia can be devastating and should be avoided with every effort. However insulin use should not be completely stopped in patients with Type 1 Diabetes, but significant reduction may be needed. When a patient with diabetes is deteriorating towards the end of life, the risks and side effects of management of diabetes can make the process

complicated, difficult or uncomfortable. The management plan should be made with every effort to ensure reaching a peaceful state in the final end.

References

1. Cohen DH, Leroith D. Obesity, Type 2 diabetes, and cancer: the insulin and IGF connection. *Endocr. Relat, Cancer*, vol. 19, no. 5, 2012, pp. 27–45.
2. National Institute for Health and Clinical Care Excellence, NICE, Quality standards for End of Life care in Adults (QS13).
3. International Diabetes Federation (IDF) 2013 Global Guideline for Managing Older People with Type 2 Diabetes. IDF, Brussels, Belgium.
4. Wachterman MW, Pilver C, Smith D, et al, Quality of end of life care provided to patients with different serious diseases, *JAMA Intern Med*, no. 176, 2016, pp. 1095-102.
5. Crane PK, Walker R, Hubbard RA et al, Glucose levels and risk of dementia, *N. Engl.J. Med*, vol. 369, no. 6, 2013, pp. 540–548.
6. Winston WT, McMillan JM, Palliative Cancer Care Guidelines,
7. Feinkohl I, Aung PP, Keller M et al, Severe hypoglycemia and cognitive decline in older people with Type 2 diabetes: the Edinburgh Type 2 diabetes study, *Diabetes Care*, vol. 37, no. 2, 2014, pp. 507–515.
8. Seaquist ER, Anderson J, Childs B et al, Hypoglycemia and diabetes: a report of a workgroup of the American Diabetes Association and the Endocrine Society, *Diabetes Care*, vol. 36, no. 5, 2013, pp. 1384–1395.
9. Department of Health, More care less pathway: an independent review of the Liverpool Care Pathway, 2013.
10. World Palliative Care Alliance (WPCA) and World Health Organization (WHO), Global atlas of palliative care at the end of life. www.thewpca.org
11. Diabetes UK, 2012, End of life diabetes care: full strategy document 2nd ed.
12. National Institute for Health and Clinical Care Excellence (NICE) Clinical Care Summaries, Palliative Care: General Issues.
13. Pomerleau J, Knai C, Nolte E, 2008, the burden of chronic disease in Europe. In: *Caring for People with Chronic Conditions: A Health System Perspective*. Nolte E, McKee M (Eds). Open University Press, Oxford, UK, 15–42.
14. American Diabetes Association, Older adults: Standards of Medical Care in Diabetes— *Diabetes Care*, no. 41, 2018, pp. 119-25.
15. The National Council for Palliative Care, 2011, What people want to live and die well.
16. McEwen LN, Kim C, Haan M et al, Diabetes reporting as a cause of death: results from the Translating Research Into Action for Diabetes (TRIAD) study, *Diabetes Care* vol. 29, no. 2, 2006, pp. 247–253.
17. Diabetes UK. End of life diabetes care, 3rd Ed.
18. General Medical Council, GMC, Treatment and care towards the end of life: good practice in decision making.
19. Emanuel L, Alexander C, Arnold RM et al, Integrating palliative care into disease management guidelines, *J. Palliat. Med*, vol. 7, no. 6, 2004, pp. 774–783.
20. Dunbar RIM. Breaking bread: the functions of social eating. *Adaptive Human Behavior and Physiology* 2017; 3:198-211.23.

21. Thomas R. Nutritional support for the dying or severely demented patients MSD Manual Professional Version.
22. Dunning T, Martin P, Savage S, Duggan N, 2010, Guidelines For Managing Diabetes At The End Of Life. Centre for Nursing and Allied Health Research, Geelong Australia.
23. Diabetes UK. Position Statements Management of hyperglycaemia and steroid (glucocorticoid) therapy: a guideline from the Joint British Diabetes Societies –for Inpatient Care Group (JBDS-IP). doi: 10.11/dme.13675.
24. Dunning T, Savage S, Duggan N, Martin P, Developing clinical guidelines for end-of-life care: blending evidence and consensus, *Int. J.Palliat. Nurs*, vol. 18, no. 8, 2012, pp. 397–405.
25. June James, Dying well with diabetes. *Annals of Palliative Medicine*, vol. 8, no. 2 , 2019, pp. 178-189
26. Denise Soltow Hershey, Importance of Glycemic Control in Cancer Patients with Diabetes: Treatment through End of Life, *Asia-Pacific Journal of Oncology Nursing*, vol. 4, no. 4, 2017, pp. 313-318